

Work Order ID 132272

Tuesday, May 05, 2015 10:05:07 AM

132272

Page 1

Item ID: D407-667-205TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Turning Detail

Stop

NS2

Start Date: 5/5/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: MLS

Date: MAY 05 2015

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D407-667-245

Rev F G

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8531 on both ends as per Folio FA248

2-Turn first side as per Folio FA248

3-Blend transition lines only, **do not sand whole tube**:

FOLIO REV: AA

DWG REV: 6

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

1.0 Φ
mm
15/05/11

110

QC1- Inspection performed by CMM

0.00

110

QC

Memo

0.00

Quality Control

1 Φ
mm
15/05/11

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Page 2

Item ID: D407-667-205TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Turning Detail

Stop ***NS2***Start Date: 5/5/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

120

0.00

120

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA248

2-Blend transition lines only, **do not sand whole tube**:

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

FOLIO REV: AADWG REV: 6

3-Remove sand and plugs

4-Scribe part # and batch # using vibrating stylus as per Dwg D407-667-245

1 0
mmL
15/05/13

130

QC1- Inspection performed by CMM

0.00

130

QC

Memo

0.00

Quality Control

1 0
mmL
15/05/13

Work Order ID 132272

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Page 3

Item ID: D407-667-205TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Turning Detail

Stop

NS2

Start Date: 5/5/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/5/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. SDAS
140	QC8- Inspect parts - second check	0.00				1	0		47
140									9-89
QC	Memo	0.00							
Quality Control								15-05-13	
145		0.00							
145									
Crosstubes	Memo	0.00							
Crosstubes	Grind off circumferential machining marks longitudinally.							15-05-14	
150		0.00							
150									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	1- PRESSURE WASH X-TUBE INSIDE AND OUT							15/05/20	
	2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE								

Work Order ID 132272

Tuesday, May 05, 2015 10:05:07 AM

132272

Page 4

Item ID: D407-667-205TRN Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Crosstube Turning Detail
 Start Date: 5/5/2015 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 5/5/2015 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160	QC5- Inspect part completeness to step on W/O	0.00							
160									
QC	Memo	0.00				1			QB 15-05-21
Quality Control									
170	Packaging	0.00							
170									
Packaging	Memo	0.00				BL			15/05/21
Packaging	Identify and stock in kanban rackLocation:	LG							
180	QC21- Final Inspection - Work Order Release	0.00							
180									
QC	Memo	0.00				MLJ			MAY 2 1 2015
Quality Control									

MLJ MAY 2 1 2015

Picklist Print

Tuesday, May 05, 2015 10:05:11 AM

Page 1

Work Order ID: 132272

132272

Parent Item: D407-667-205TRN

D407-667-205TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 5/5/2015

Required Date: 5/5/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
IPP Rev B 08.04.02 Removed polish EC verified by: DD
IPP Rev:C 08-08-19 revE as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6011-115		Manufactured	No			120	Each	48.0000	1	1			

D6011-115

Crosstube Material

Location

Loc Qty

Loc Code

LG003

48

107880

22

107881

14

67798

6

75639

6

mm 15/05/11

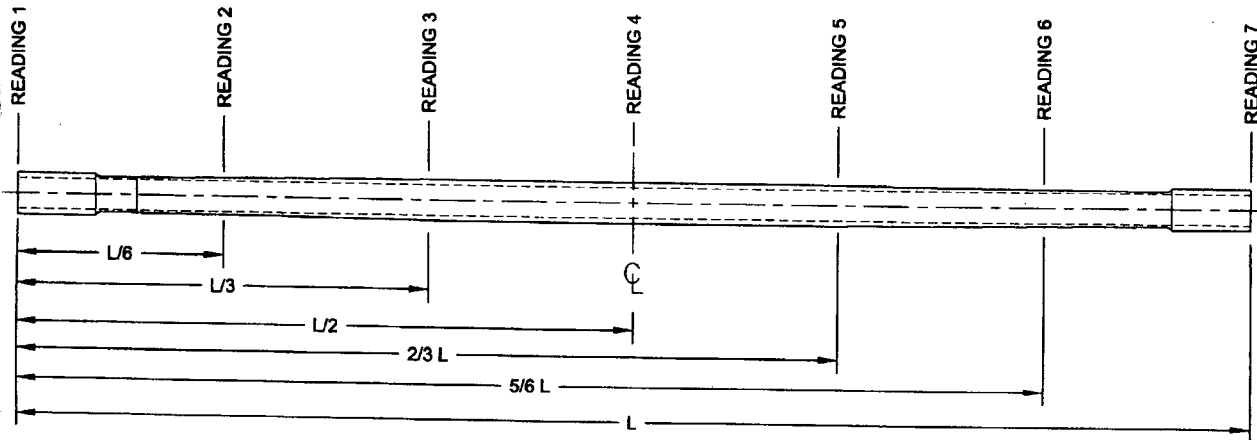
DART AEROSPACE LTD		Work Order:	132272
Description: Crosstube Assembly		Part Number:	D407-667-245
Inspection Dwg: D407-667-245 Rev: 4		Page 1 of 2	

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	2.493	✓		vern	CNC-08
	1.832	+0.005/-0.000	1.834	✓			
	1.838	+0.005/-0.000	1.841	✓			
	1.892	+0.005/-0.000	1.894	✓			
	2.052	+0.005/-0.000	2.054	✓			
	2.206	+0.005/-0.000	2.208	✓			
	2.521	+0.005/-0.000	2.526	✓			
	2.633	+0.005/-0.000	2.638	✓			
	4.10	+/-0.030	4.10	✓			
	4.978	+/-0.030	4.986	✓			
	2.040	+0.000/-0.010	2.032	✓			
	0.125	+/-0.010	.125	✓			
	R0.063	+/-0.010	.063	✓		R6	
	R0.500	+/-0.010	.500	✓		"	
	2.490	+0.005/-0.000	2.493	✓		vern	CNC-08
SIDE B	1.832	+0.005/-0.000	1.834	✓			
	1.838	+0.005/-0.000	1.840	✓			
	1.892	+0.005/-0.000	1.893	✓			
	2.052	+0.005/-0.000	2.053	✓			
	2.206	+0.005/-0.000	2.208	✓			
	2.521	+0.005/-0.000	2.524	✓			
	2.633	+0.005/-0.000	2.636	✓			
	4.10	+/-0.030	4.100	✓			
	4.978	+/-0.030	4.980	✓			
	2.040	+0.000/-0.010	2.031	✓			
	0.125	+/-0.010	.125	✓			
	R0.063	+/-0.010	.063	✓		R6	
	R0.500	+/-0.010	.500	✓		"	
	112.91	+/-0.020	112.91	✓		tape	L6-11

DART AEROSPACE LTD		Work Order: 132272
Description: Crosstube Assembly		Part Number: D407-667-245
Inspection Dwg: D407-667-245 Rev: <i>E</i>		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.236	.235	.231	.235	.005	0.075"
READING 2 L= 19	.264	.247	.220	.232	.044	
READING 3 L= 37	.430	.465	.373	.389	.057	
READING 4 L= 56	.653	.648	.637	.636	.017	
READING 5 L= 75	.413	.433	.418	.397	.036	
READING 6 L= 93	.249	.270	.251	.230	.040	
READING 7 L= 112	.231	.233	.233	.240	.008	

Calibration Result

Actual Block Thickness: .100 - .250

Situscan 250 Measured Thickness: .100 - .250

DAS
47

Measured by: <i>mm L</i>
Date: <i>15/05/13</i>

Audited by: <i>9-89</i>
Date: <i>15-05-13</i>

Preliminary Approval:
Date:

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-205)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	06.03.30	Tolerance revised for 4.978 dimension	KJ/JLM	
D	07.02.19	Dwg Rev updated	KJ/JLM	
E	09.05.20	Dwg Rev updated	KJ	
F	12.06.04	Wall thickness form added	KJ	

Item	QTY	PART NUMBER	DESCRIPTION
	-245		
	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
1	1	D8011-115	CROSSTUBE
2	2	D2873-043	NUT PLATE
3	2	D2873-045	NUT PLATE
4	1	D2894-1	SUPPORT
5	2	D3190-1	CHAFING SHIELD
6	2	D3595-063-430	RUBBER CUSHION
7	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
8	4	MS21920-22	CLAMP
9	2	MS21920-25	CLAMP (OR MS21920-24)
10	AR	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
11	AR	PROSEAL 890	SEALANT

GENERAL NOTES:

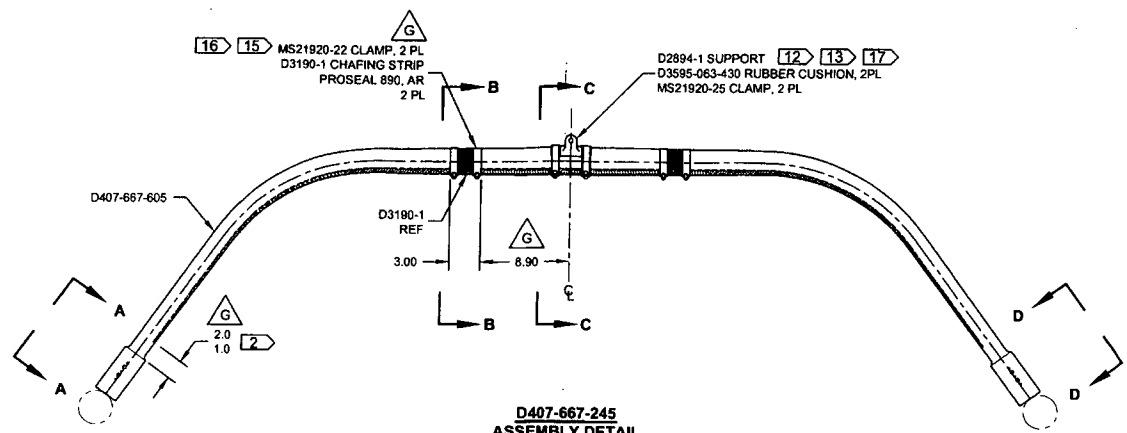
- MATERIAL: MANUFACTURED FROM D8011-115
FINISHED LENGTH = 112.91±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT CROSSTUBE PER DART QSI 005 4.2
FOR HATCHED AREAS (ZN A6-2), MASK AS REQUIRED
TO APPLY PRIME AND APPLY CLEAR COAT ONLY
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 27.7 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1 CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEAL D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS 50 TO 70 DEGREES FROM BOTTOM OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- TORQUE CLAMPS 80 TO 100 IN-LB. TORQUE CLAMPS ON D3190-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

RELEASED

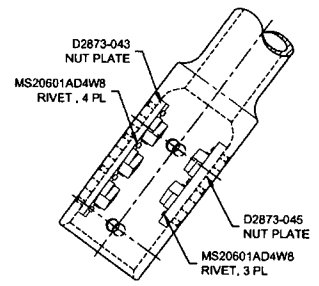
2015 APR 09

ECN 15-557

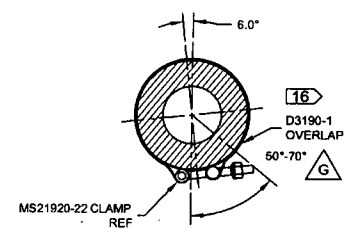
G	INCCORP. DEO's D407-667-245-F1/F2 (ZN D8-1, A8-1, D5-2, B6-2, C6-2); 8.90 WAS 8.53 (ZN D5-2); TORQUE REDUCED FOR CHAFING SHIELD (ZN A8-1); FINISH REVISED TO ALLOW MANUFAC. FLEXIBILITY (ZN C8-1)	RF	15.03.20
F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -B51 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. G
MFG. APPR.	RF	D407-667-245	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	15.03.20	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS COVENANT THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



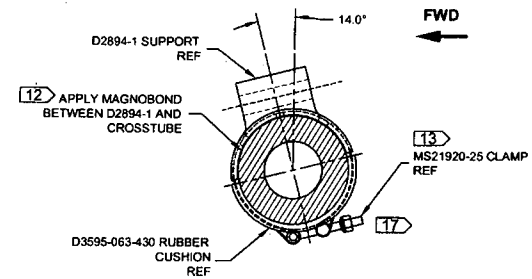
**D407-667-245
ASSEMBLY DETAIL
(VIEW LOOKING FWD)**



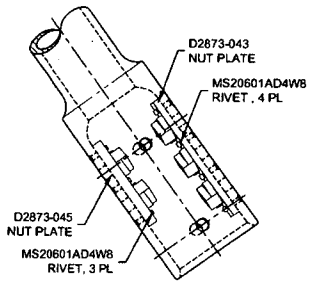
**VIEW A-A CUFF DETAIL
SCALE 4X**



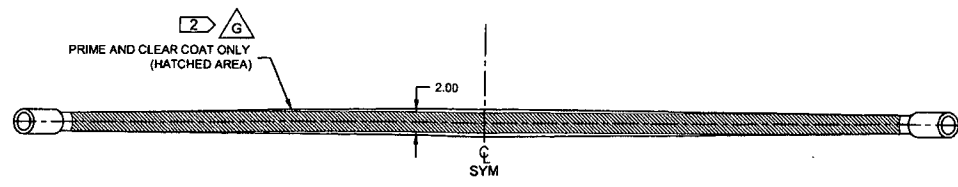
**SECTION B-B
SCALE 4X, 2PL**



**SECTION C-C
SCALE 4X**



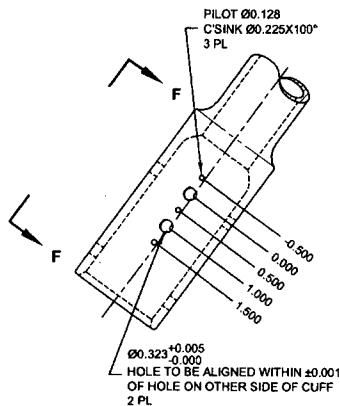
**VIEW D-D CUFF DETAIL
SCALE 4X**



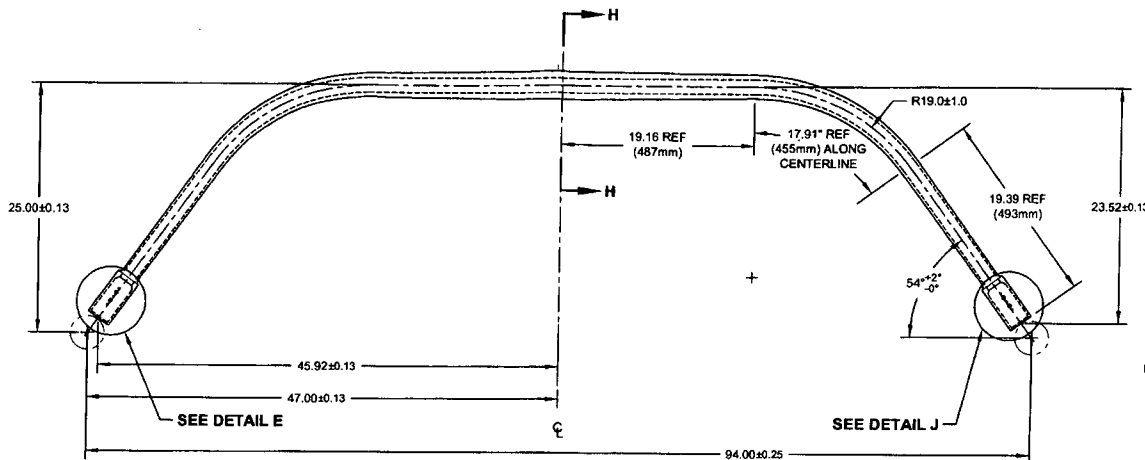
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2015 APR 09 *qp*

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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>qp</i>	DRAWING NO.	REV. G
MFG. APPR.	<i>qp</i>	D407-667-245	SHEET 2 OF 4
APPROVED	<i>qp</i>	TITLE	SCALE
DE APPR.	<i>qp</i>	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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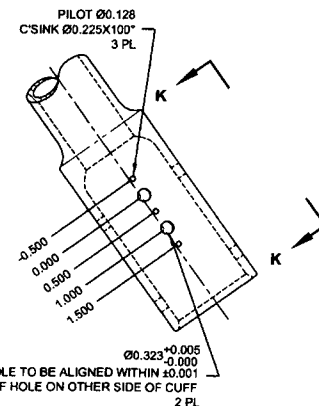
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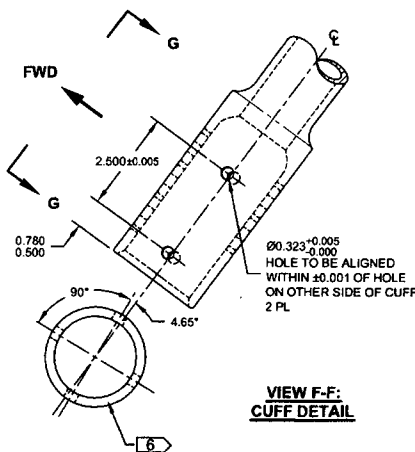
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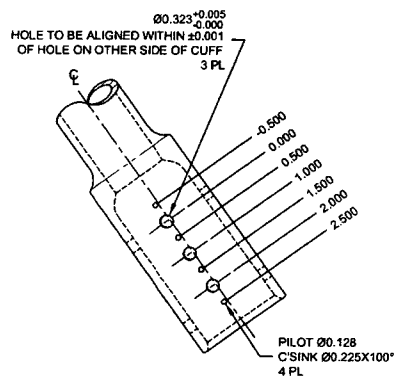
D407-667-605
BENDING AND DRILLING DETAIL
(VIEW LOOKING FWD)



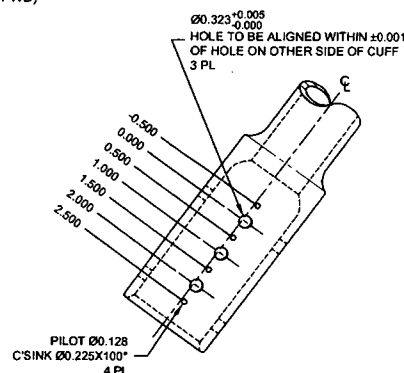
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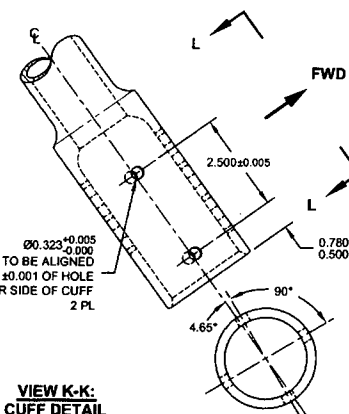
VIEW F-F:
CUFF DETAIL



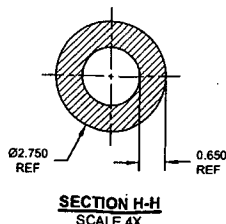
VIEW G-G
(VIEW LOOKING AFT, ROTATED)



VIEW L-L
(VIEW LOOKING AFT, ROTATED)



VIEW K-K:
CUFF DETAIL



SECTION H-H
SCALE 4X

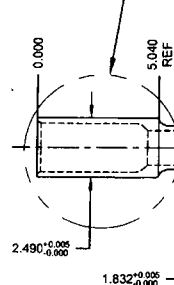
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2015 APR 09

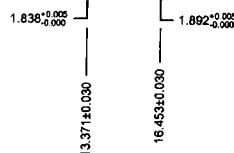
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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	47	DRAWING NO.	REV. G
MFG. APPR.	47	D407-667-245	SHEET 3 OF 4
APPROVED	47	TITLE	SCALE
DE APPR.	47	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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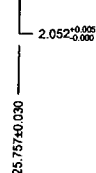
SEE DETAIL M



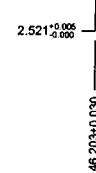
R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS



R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS



R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

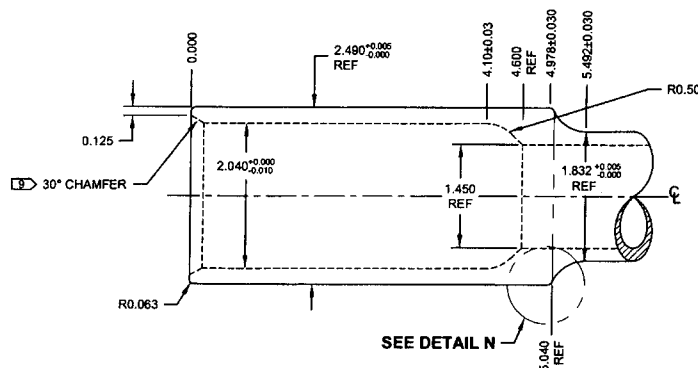


SEE DETAIL P

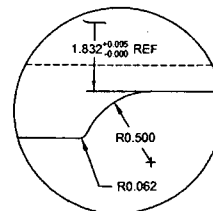
TAPER UNIFORMLY FROM
2.833^{+0.005}/_{-0.000} REF THROUGH TO 2.790^{+0.005}/_{-0.000} REF
RUNNING OFF PART

2.750
STOCK

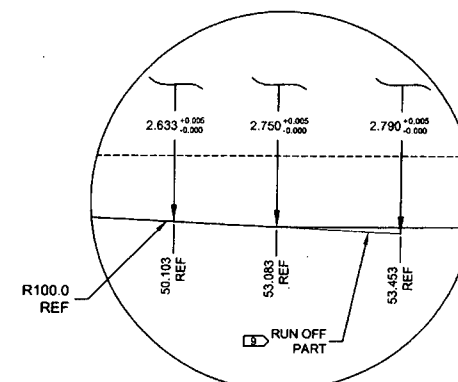
D407-667-245 MACHINING DETAIL



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

RELEASED

2015 APR 09

DESIGN	40	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	40	DRAWING NO.	REV. G
MFG. APPR.	40	D407-667-245	SHEET 4 OF 4
APPROVED	40	TITLE	SCALE
DE APPR.	40	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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